

**REMARKS**

In view of the above amendments and the following remarks, reconsideration and allowance of the pending claims are respectfully requested.

In the outstanding Office Action of March 27, 2007, claims 1-17 and 20-24 were rejected under 35 U.S.C. § 103(a) as being obvious over Mutchler in view of Romero. Claims 18 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mutchler in view of Romero. Claims 19 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mutchler in view of Romero and further in view of Eaves (EP 1217294).

In rejecting the pending claims, the Examiner contends that Mutchler comprises a radiant tube heater 26. Mutchler is directed to an air heating apparatus having a housing 3 with a lower partition plate 4 to provide an air inlet plenum 6 having air inlets 7 and a lower exhaust outlet 8. Vertically disposed in the housing 3 is a combustion drum 13 with a burner 18 disposed thereabove. The hot exhaust gases exiting through outlets 24 in drum 13 are conducted downwardly through a plurality of heat exchanger tubes 26. Thereafter, the gas enters an annular outlet manifold 27 and an exhaust conduit 28 connects the manifold 27 with the outlet 8.

As amended above, claim 1 recites that the radiant tube heater comprises an elongate tube and a burner within said elongate tube. The burner 18 of Mutchler is not disposed within the exhaust conduit 28. This feature of claim 1 is thus not disclosed in Mutchler.

Further, as amended above, claim 1 recites that the hot combustion products flow in a single axial direction along said elongate tube. Mutchler uses a burner where secondary combustion air 17 is injected near the end of the combustion flame,

in an *opposite* direction to the flow of the flame. Thus, the combustion products must undergo a U-turn in direction before exiting combustion drum 13 through outlets located proximal the burner head 18. In contrast, the radiant tube heater of the present invention injects secondary air through annulus 26 and along the annular tube 28 that surrounds the main burner premixer 30. As such, secondary air is injected around the base of the flame, proximal the burner head 32 and the hot combustion products flow in a single axial direction, as recited in claim 1, in order to exit at the end of the heater opposite to the burner. The claimed arrangement advantageously results in a long flame within the burner and thus increases the proportion of combustion energy released as radiant energy. Thus, Mutchler does not disclose or suggest that the hot combustion products flow in a single axial direction along the elongate tube, as recited in claim 1.

In the Advisory Action mailed July 11, 2007, the Examiner acknowledges with respect to Mutchler that "section 28 is not spiral". The Examiner thus relies upon Romero for teaching "a spiral arrangement given the terms broadest reasonable interpretation." Romero is directed to a heat exchanger for reheating a secondary fluid such as a pool of fresh or sea water. Romero discloses a coil 10 formed by a helical tube. At its upper end, the coil 10 ends in an elbow 11 and has an inlet 12 by which the heated primary fluid is introduced. At the other end, the coil 10 forms an elbow 13 extended by a rectangular part 14 running into an outlet 15, by which the heated primary fluid leaves after having transferred its calories to the secondary water.

As amended above, claim 1 recites that the spiral tube assembly comprises a straight portion and a spiral portion, the spiral portion being downstream of the

straight portion and helically wrapped around the straight portion such that the hot combustion products pass first through said straight portion and then through said spiral portion. In contrast to the claimed invention, the secondary fluid in Romero enters the inlet 12, passes through the coil 10, and then the rectangular part 14 before exiting through outlet 15. As such, the coil 10 is located upstream of the rectangular part 14. This feature of claim 1 is thus not disclosed in Romero.

Accordingly, even if the teachings of *Romero* were combined with the primary reference, Applicants respectfully contend that the claimed invention would not be rendered obvious. There is no suggestion for containing the burner 18 of Mutchler within the exhaust conduit 28 and there is no suggestion for reversing the flow of fluid through the coil 10 of Romero. In fact, in this regard, Romero specifically notes a significance in that the water to be reheated flows upwardly while the primary fluid flows downwardly in the coil 10, concurrent to the water of the secondary fluid. Applicants respectfully submit that the rejection of the claims as being unpatentable over Mutchler in view of Romero should be withdrawn.

### CONCLUSION

In view of the above amendments and remarks, Applicants respectfully submit that the claims of the present application are now in condition for allowance, and an early indication of the same is earnestly solicited.

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Should any questions arise in connection with this application or should the Examiner believe that a telephone conference would be helpful in resolving any remaining issues pertaining to this application; the Examiner is kindly invited to call the undersigned counsel for Applicant regarding the same.

Respectfully submitted,

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